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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/743,337

12/23/2003

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740756-2691

5581

22204 7590 01/11/2008
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EXAMINER

YAMNITZKY, MARIE ROSE

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

01/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/743,337	Applicant(s) TAKASU ET AL.	
	Examiner Marie R. Yamnitzky	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14, 17-20 and 22-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 17-20 and 22-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>30 Oct 2007</u> . | 6) <input type="checkbox"/> Other: _____ |

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 30, 2007 (amendment and IDS) has been entered.

2. Applicant's amendment filed October 30, 2007 amends claims 1, 2, 4-6, 9 and 11, and adds claims 22-52.

Claims 1-14, 17-20 and 22-52 are pending.

3. Claims 1-14, 17-20 and 22-52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The variable "x" in formula (I) is not explicitly defined in any of the claims. (The examiner regrets the delay in noting this issue. For purposes of comparing to the prior art, the examiner has interpreted, and continues to interpret, "x" as being 1 or more and representing the number of directly coupled units of formula (I) within the polymer.)

Claims 28-32 require a film including aluminum as its "main" component. The limitations imposed by the term "main" are not clear. The term "including" leaves the composition of the film open to components other than aluminum. It is not clear if "main"

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places any specific numerical limitation on the minimum amount of aluminum in the film. The specification does not define what is meant by a "main" component.

There is no antecedent basis for "the plurality of second electrodes" as recited in claims 36, 41 and 46. These three claims depend from claim 9, which does not require a plurality of second electrodes.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns et al. (WO 02/26859 A1) in view of *Grant & Hackh's Chemical Dictionary* 5th ed. (1987), page 53.

See the entire WO publication. In particular, see from the paragraph bridging pages 3 and 4 through the first full paragraph on page 9, pages 11-13, the second paragraph on page 14 through the second paragraph on page 15, page 23 through the first full paragraph on page 24, and Example 5 on page 27.

Towns et al. disclose polymers for use in organic light emitting devices wherein a layer of the polymer is disposed between two electrodes. The polymers may comprise one or more G

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groups and a core group such as disclosed with respect to formulae XVI and XVII on page 11. Page 12 teaches that each G is preferably a substituted or unsubstituted thiophene group, with aryl groups being among the preferred substituent groups on G. The core group may be a unit of present formula (a-1) wherein R₁ and R₂ are identical and each is an organic substituent that includes a nitrogen atom, such as when the core group has formula IX or XI as shown on pages 8 and 9, respectively.

Also see formulae XX and XXI on page 13. While Towns et al. do not disclose a specific example of a polymer having general formula (I) as defined in the present claims as a repeating unit, such polymers would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention given Towns' teaching of aryl-substituted thiophene groups for G and teaching of formulae IX and XI for the core group. It is the examiner's position that one of ordinary skill in the art at the time of the invention would have at once envisaged a phenyl-substituted thiophene group of present formula (b-1) for G of Towns' polymers given the thiophene structures shown in Towns' formula XX and XXI and given that a phenyl group is a basic aryl group. For example, see the definition of "aryl" as set forth on page 53 in *Grant & Hackh's Chemical Dictionary*.

Based on the teachings of Towns et al. and the knowledge that a phenyl group is an aryl group, one of ordinary skill in the art at the time of the invention would have reasonably expected that polymers having regions similar to formula XX with a core group of formula IX having two diarylamino substituents in place of a core group having one diarylamino substituent,

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and having a phenyl group at each of R^4 - R^7 , would be suitable for use in organic light emitting devices as taught by Towns et al.

With respect to present claim 3, product by process claims are not limited to the method steps recited, but to the structure implied by the steps. In the present case, the structure implied by the recitation "the layer is formed by electrolytic polymerization" is a layer of polymer having general formula (I) as a repeating unit. The prior art suggests such a layer.

With respect to present claims 22 and 23, polymers having present general formula (I) as a repeating unit wherein each of m and n is 2 are suggested by Towns' teaching on page 11 that n is preferably 1 or 2 for formula XVI.

6. Claims 4-12, 17, 18 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns et al. (WO 02/26859 A1) in view of *Grant & Hackh's Chemical Dictionary* 5th ed. (1987), page 53, as applied to claims 1-3, 22 and 23 above, and further in view of Zhuang et al. (US 6,602,395 B1).

Town et al. disclose a light emitting device comprising a layer of polymer between a pair of electrodes. Town et al. do not disclose a device comprising a plurality of electroluminescent elements as in present claim 4 and dependents, or a device having the electrode and layer arrangements required by present claims 6, 9, 11 and dependents.

The use of a plurality of electroluminescent elements to form a display was known in the art at the time of the invention, as was the electrode and layer arrangements set forth in claims 6, 9 and 11. For example, see column 1, line 8-c. 2, l. 43 of the patent to Zhuang et al.

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It would have been an obvious modification to one of ordinary skill in the art at the time of the invention to use polymers suggested by Towns et al. to provide light emitting display device structures known in the art at the time of the invention, such as those discussed by Zhuang et al.

With respect to the requirement of claims 5, 7, 10, 11 and claims dependent from 11 for multiple different polymers having general formula (I) as a repeating unit, Towns et al. teach at the bottom of page 12 that properties including emission color of the polymer may be tuned. Towns et al. also teach that the polymers may contain units in addition to the G/core group-containing units (e.g. see formula XXII on page 15). One of ordinary skill in the art at the time of the invention would recognize that emission color could also be tuned by appropriate selection of the additional repeating units. Zhuang et al. also disclose the use of copolymers comprising thiophene units and aromatic units as light emitters, and teach that multi-colored displays may be made by using different polymers having different light emitting characteristics (e.g. see c. 8, l. 33-c. 10, l. 22). It would have been within the level of ordinary skill of a worker in the art at the time of the invention to make and use different polymers comprising Towns' G/core group-containing units in order to provide a multi-colored display having general device features (such as patterned electrodes) that were known in the art at the time of the invention such as discussed by Zhuang et al.

7. Claims 13, 14, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns et al. (WO 02/26859 A1) in view of *Grant & Hackh's Chemical Dictionary* 5th ed.

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(1987), page 53, and further in view of Zhuang et al. (US 6,602,395 B1) as applied to claims 4-12, 17, 18 and 24-27 above, and further in view of Kamatani et al. (US 2003/0059646 A1).

Zhuang et al. provide pixellated light emitting displays. The paragraph bridging columns 1 and 2 of the Zhuang patent indicates that there are conventional matrix-addressing schemes, but Zhuang et al. do not explicitly describe the additional features required by present claims 13, 14, 19 and 20.

Data signal lines, scan signal lines, and nonlinear elements such as thin film transistors, are not novel components of pixellated light emitting displays. For example, see the Figures in the published application of Kamatani et al.

It would have been an obvious modification to one of ordinary skill in the art at the time of the invention to use polymers suggested by Towns et al. to provide pixellated light emitting displays of display device structures known in the art at the time of the invention, such as those discussed by Zhuang et al., and to include components known in the art of pixellated light emitting displays, such as the electrical components disclosed for the pixellated light emitting displays described by Kamatani et al.

8. Claims 28 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns et al. (WO 02/26859 A1) in view of *Grant & Hackh's Chemical Dictionary* 5th ed. (1987), page 53, as applied to claims 1-3, 22 and 23 above, and further in view of Wolk et al. (US 6,194,119 B1).

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Towns et al. do not disclose the multilayered electrode required by claims 28 and 33. Wolk et al. disclose various materials that may be used to make the electrodes of a light emitting device, including materials within the scope of those required for the electrodes of claims 28 and 33, and teach that electrodes may be multilayered (e.g. see the paragraph bridging columns 15 and 16). Absent a showing of criticality for a particular electrode structure/composition, it is the examiner's position that it would have been within the level of ordinary skill of a worker in the art at the time of the invention to make light emitting devices using polymers suggested by Towns et al. and to construct the electrodes of the devices using materials and structures known in the art at the time of the invention to be suitable for use as electrodes of a light emitting device, such as those taught by Wolk et al.

9. Claims 29-32 and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns et al. (WO 02/26859 A1) in view of *Grant & Hackh's Chemical Dictionary* 5th ed. (1987), page 53, and further in view of Zhuang et al. (US 6,602,395 B1) as applied to claims 4-12, 17, 18 and 24-27 above, and further in view of Wolk et al. (US 6,194,119 B1).

Towns et al. do not disclose the multilayered electrode(s) required by claims 29-32 and 34-37. Wolk et al. disclose various materials that may be used to make the electrodes of a light emitting device, including materials within the scope of those required for the electrodes of claims 29-32 and 34-37, and teach that electrodes may be multilayered (e.g. see the paragraph bridging columns 15 and 16). Absent a showing of criticality for a particular electrode structure/composition, it is the examiner's position that it would have been within the level of

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ordinary skill of a worker in the art at the time of the invention to make light emitting devices using polymers suggested by Towns et al. and to construct the electrodes of the devices using materials and structures known in the art at the time of the invention to be suitable for use as electrodes of a light emitting device, such as those taught by Wolk et al.

10. Claim 38, 43 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns et al. (WO 02/26859 A1) in view of *Grant & Hackh's Chemical Dictionary* 5th ed. (1987), page 53, as applied to claims 1-3, 22 and 23 above, and further in view of Mori et al. (US 5,281,489).

In Example 5, Towns et al. provide a device in which a layer including a conductive polymer (the hole transport material PEDOT) is provided on the first electrode as required by claim 38, but Towns et al. do not disclose the layer comprising an inorganic compound as required by claim 38. In Example 5, Towns et al. also provide an encapsulant layer, but Towns et al. do not disclose the specific insulator material and structure required by claim 48. The device of Example 5 does not comprise the additional layers required by claim 43, but the device structure is not limited to that of Example 5.

Mori et al. teach that organic light emitting devices may comprise one or more layers between the anode and the light emitting layer and/or between the cathode and the light emitting layer, and that these additional layers may be made of various materials, polymeric or non-polymeric, organic or inorganic (e.g. see column 28, line 63-c. 29, l. 49). Mori et al. also teach that the light emitting devices may be used for various applications (e.g. see the paragraph

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bridging columns 29 and 30), and one of ordinary skill in the art at the time of the invention would recognize that an insulative encapsulation would be beneficial for many of the applications suggested by Mori et al. Absent a showing of criticality for particular auxiliary components/structures, it is the examiner's position that it would have been within the level of ordinary skill of a worker in the art at the time of the invention to make light emitting devices using polymers suggested by Towns et al., to provide additional functional layers between the electrodes using materials known in the art at the time of the invention to be suitable for use in light emitting devices, such as those taught by Mori et al., and to provide insulative structures suitable for the intended use of the device.

11. Claims 39-42, 44-47 and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Towns et al. (WO 02/26859 A1) in view of *Grant & Hackh's Chemical Dictionary* 5th ed. (1987), page 53, and further in view of Zhuang et al. (US 6,602,395 B1) as applied to claims 4-12, 17, 18 and 24-27 above, and further in view of Mori et al. (US 5,281,489).

In Example 5, Towns et al. provide a device in which a layer including a conductive polymer (the hole transport material PEDOT) is provided on the first electrode, but Towns et al. do not disclose the layer comprising an inorganic compound as required by claims 39-42. In Example 5, Towns et al. also provide an encapsulant layer, but Towns et al. do not disclose the specific insulator material and structure required by claims 49-52. The device of Example 5 does not comprise the additional layers required by claim 44-47, but the device structure is not limited to that of Example 5.

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Mori et al. teach that organic light emitting devices may comprise one or more layers between the anode and the light emitting layer and/or between the cathode and the light emitting layer, and that these additional layers may be made of various materials, polymeric or non-polymeric, organic or inorganic (e.g. see column 28, line 63-c. 29, l. 49). Mori et al. also teach that the light emitting devices may be used for various applications (e.g. see the paragraph bridging columns 29 and 30), and one of ordinary skill in the art at the time of the invention would recognize that an insulative encapsulation would be beneficial for many of the applications suggested by Mori et al. Absent a showing of criticality for particular auxiliary components/structures, it is the examiner's position that it would have been within the level of ordinary skill of a worker in the art at the time of the invention to make light emitting devices using polymers suggested by Towns et al., to provide additional functional layers between the electrodes using materials known in the art at the time of the invention to be suitable for use in light emitting devices, such as those taught by Mori et al., and to provide insulative structures suitable for the intended use of the device.

12. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection. The WO publication of Towns et al. has been added to address the narrowed claim limitations with respect to the group of formula (a-1). Additional references have also been relied upon to address the limitations of various new claims.

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13. Miscellaneous grammatical corrections:

In claims 40 and 41, in the phrases “each of which including” and “each of which comprising”, either “of which” should be deleted, or “including” should be changed to --includes-- and “comprising” should be changed to --comprises--.

In claims 45 and 46, --is-- should be inserted before “provided” in both occurrences of the phrase “each of which provided”.

14. The prior art made of record and not relied upon is considered pertinent to applicant’s disclosure.

US 6,998,181 B2 to O’Dell et al. is in the same patent family as the WO publication applied in this action.

15. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 7:00 a.m. to 3:30 p.m. Monday-Friday.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
January 07, 2008



**MARIE YAMNITZKY
PRIMARY EXAMINER**

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